JUN 15 2006
IAP35
PATENT & TRADEMARK OFFICE

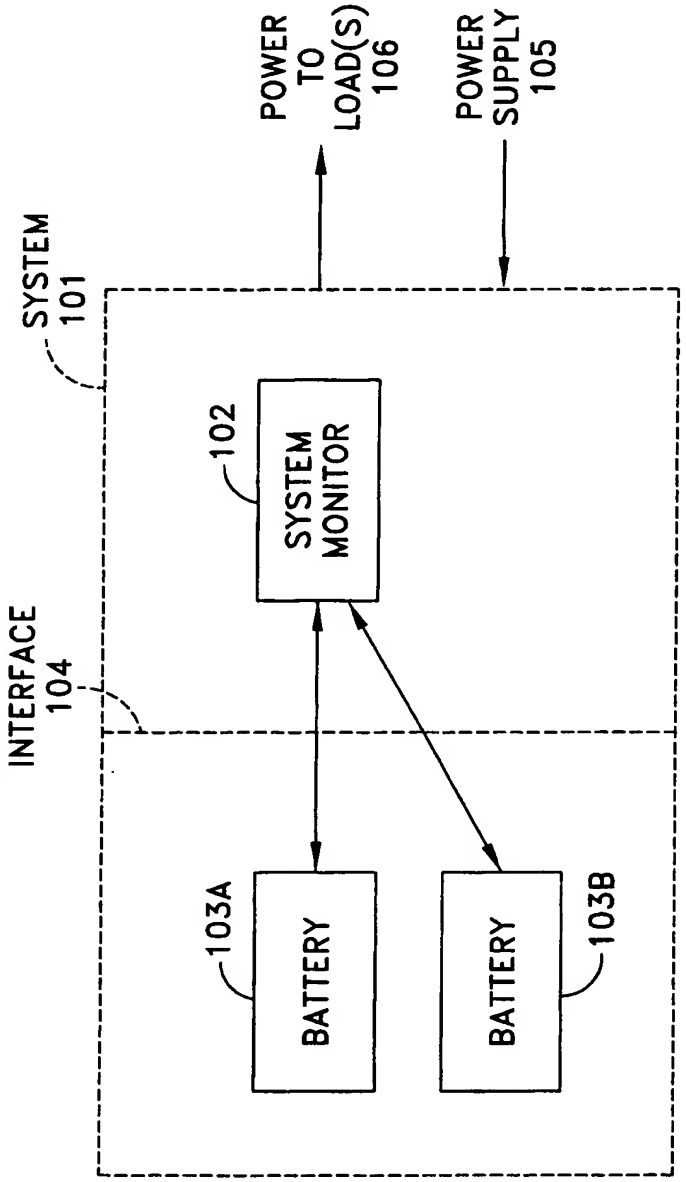


FIGURE 1

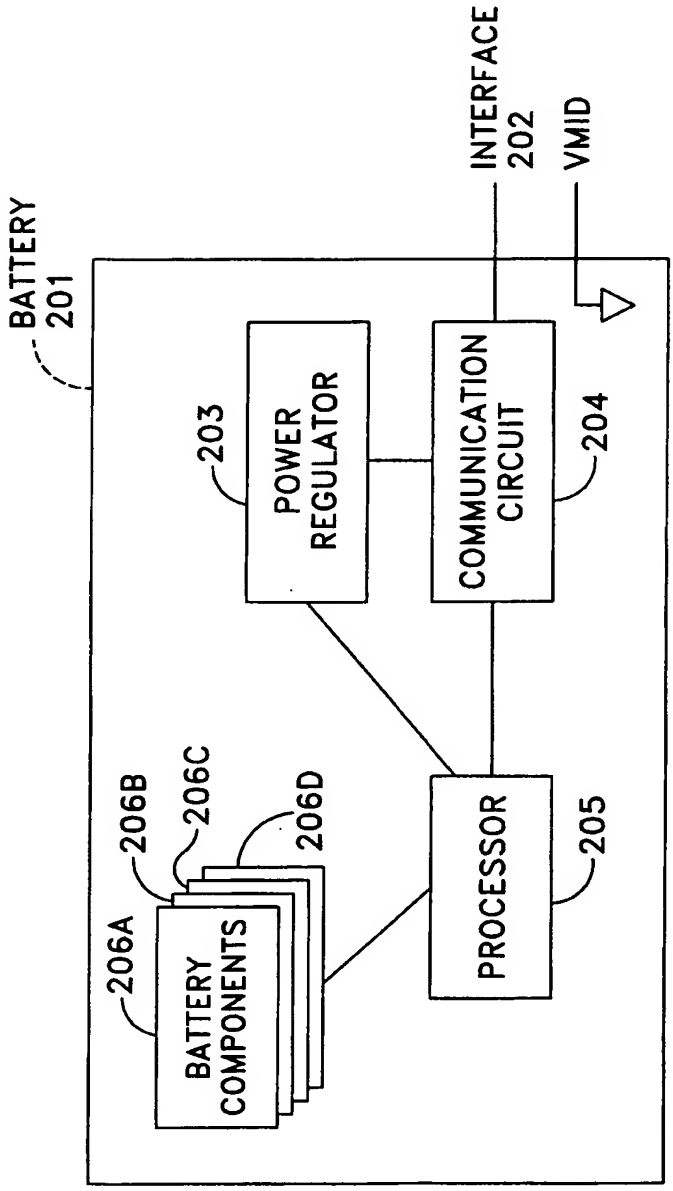

BATTERY
201
INTERFACE
202
VMID
POWER
REGULATOR
203
COMMUNICATION
CIRCUIT
204
PROCESSOR
205
BATTERY
COMPONENTS
206A
206B
206C
206D

FIGURE 2

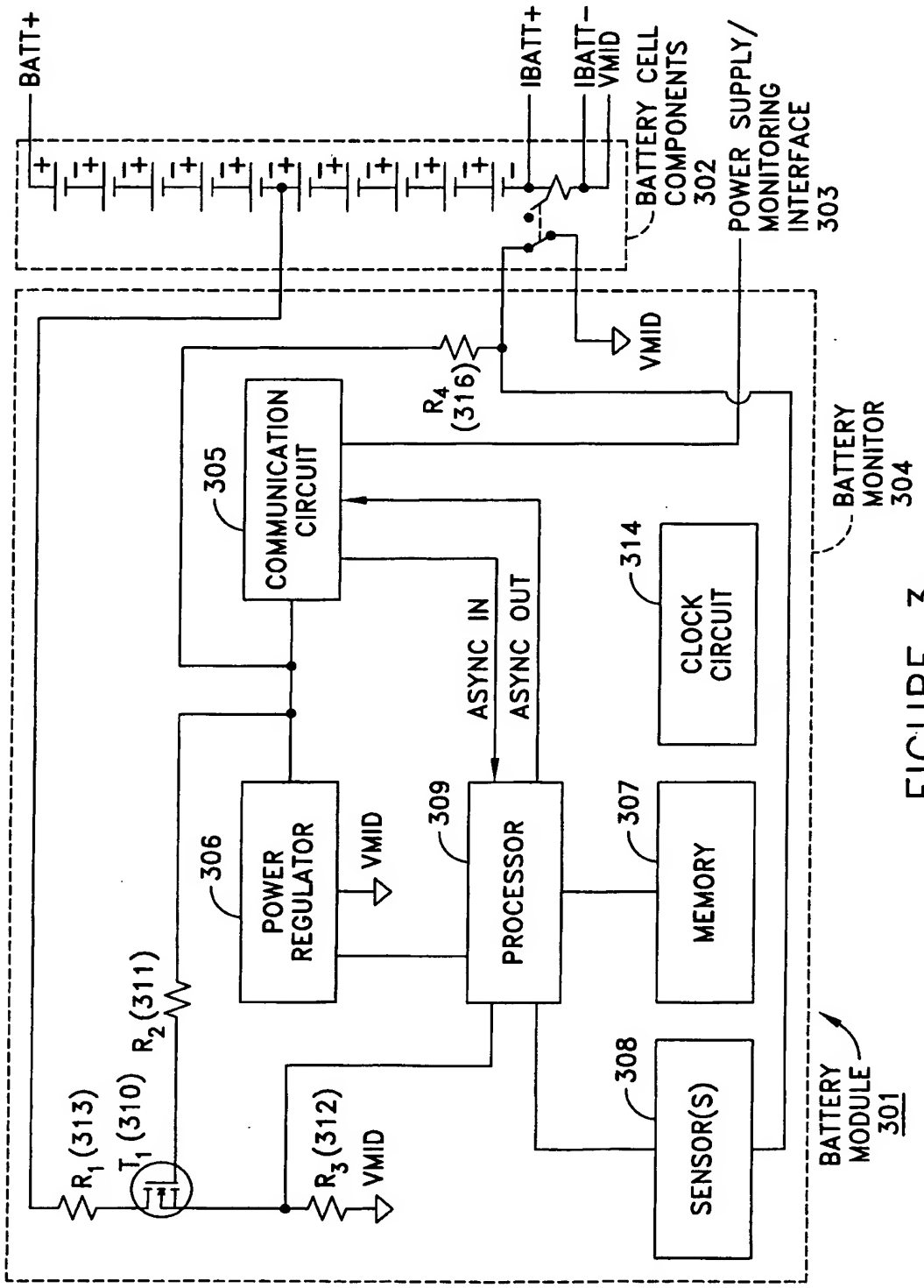

BATT+
IBATT+
IBATT-
VMID
BATTERY CELL COMPONENTS 302
POWER SUPPLY/ MONITORING INTERFACE 303
VMID
R_4 (316)
305
COMMUNICATION CIRCUIT
BATTERY MONITOR 304
314
CLOCK CIRCUIT
ASYNC IN
ASYNC OUT
306
POWER REGULATOR
VMID
309
PROCESSOR
307
MEMORY
R_2 (311)
R_1 (313)
T_1 (310)
R_3 (312)
VMID
308
SENSOR(S)
BATTERY MODULE 301

FIGURE 3

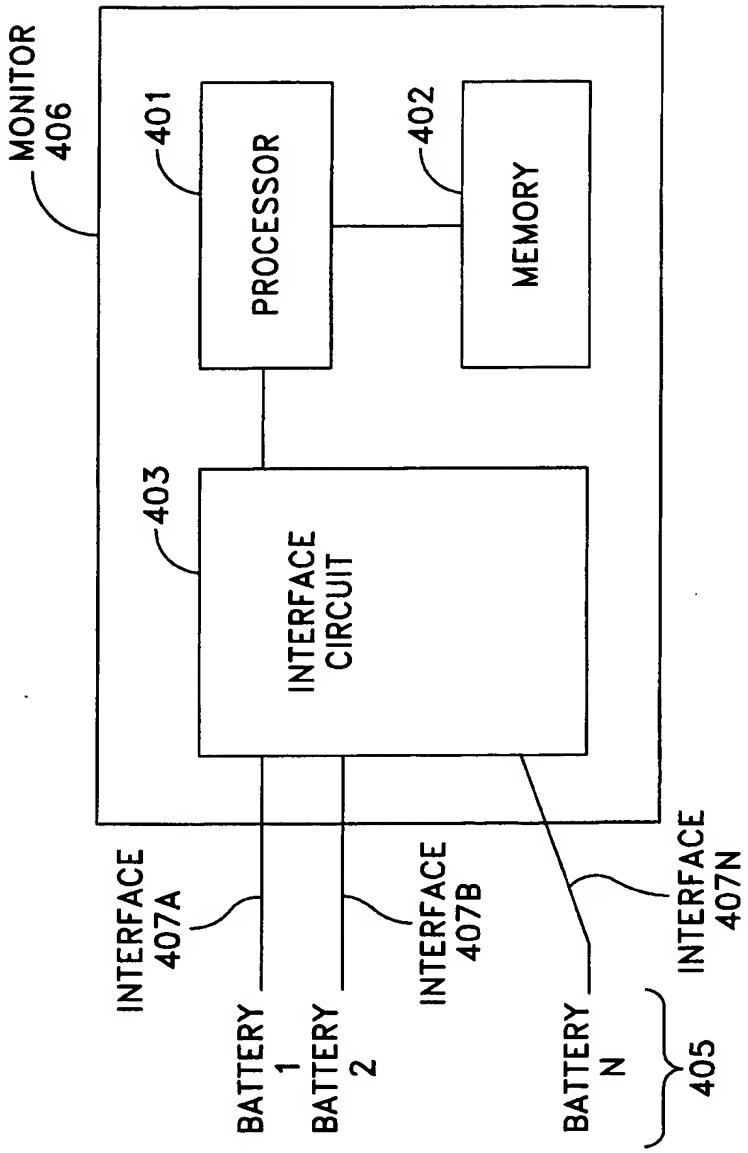

MONITOR
406
401
PROCESSOR
402
MEMORY
403
INTERFACE
CIRCUIT
INTERFACE
407A
INTERFACE
407B
INTERFACE
407N
BATTERY
1
BATTERY
2
BATTERY
N
405

FIGURE 4

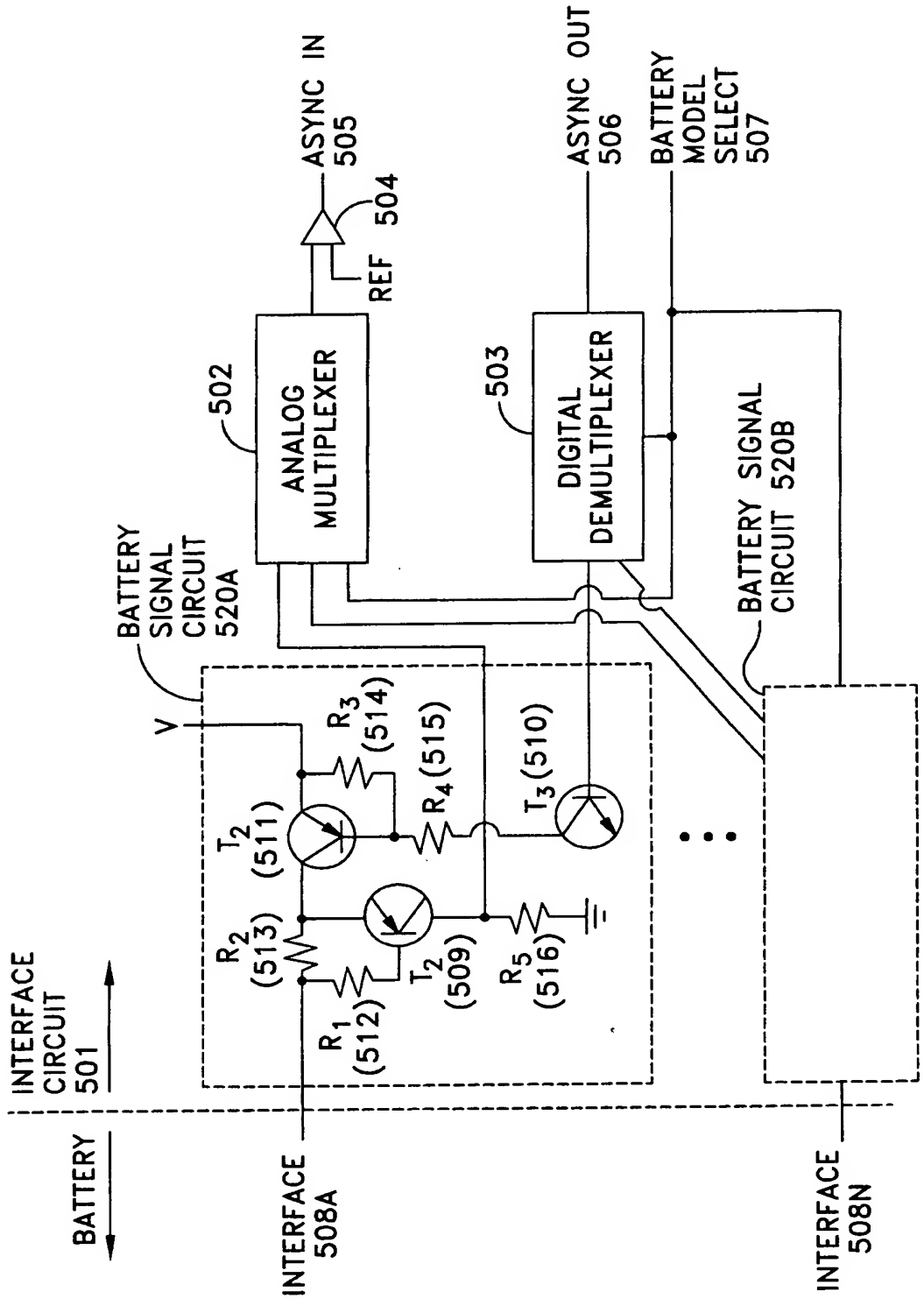

ASYNC IN 505
REF 504
ASYNC OUT 506
BATTERY MODEL SELECT 507
502
ANALOG MULTIPLEXER
503
DIGITAL DEMULTIPLEXER
BATTERY SIGNAL CIRCUIT 520A
BATTERY SIGNAL CIRCUIT 520B
V
R3 (514)
R4 (515)
T3 (510)
T2 (511)
R2 (513)
T2 (509)
R5 (516)
R1 (512)
INTERFACE CIRCUIT 501
BATTERY
INTERFACE 508A
INTERFACE 508N

FIGURE 5

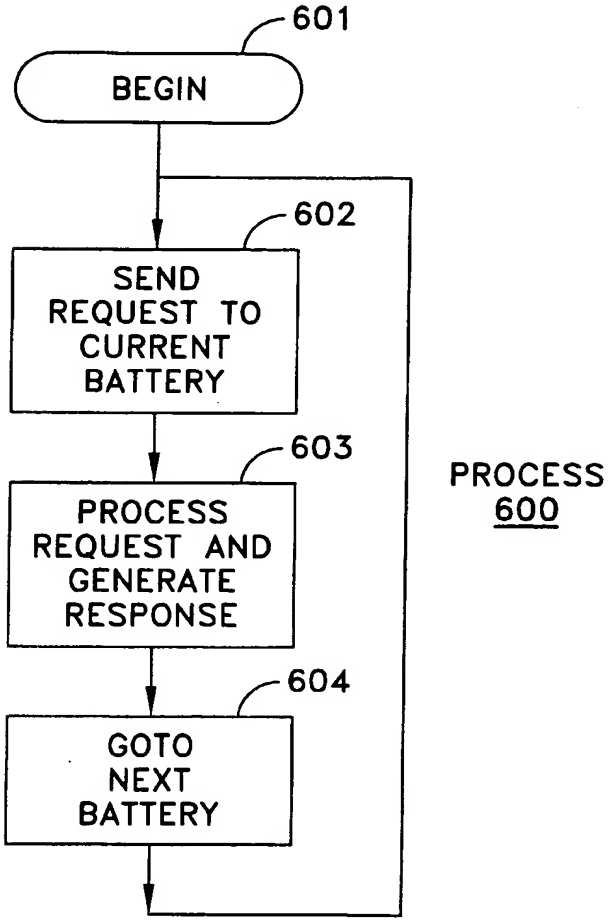

601
BEGIN
602
SEND REQUEST TO CURRENT BATTERY
603
PROCESS REQUEST AND GENERATE RESPONSE
604
GOTO NEXT BATTERY
PROCESS 600

FIG. 6

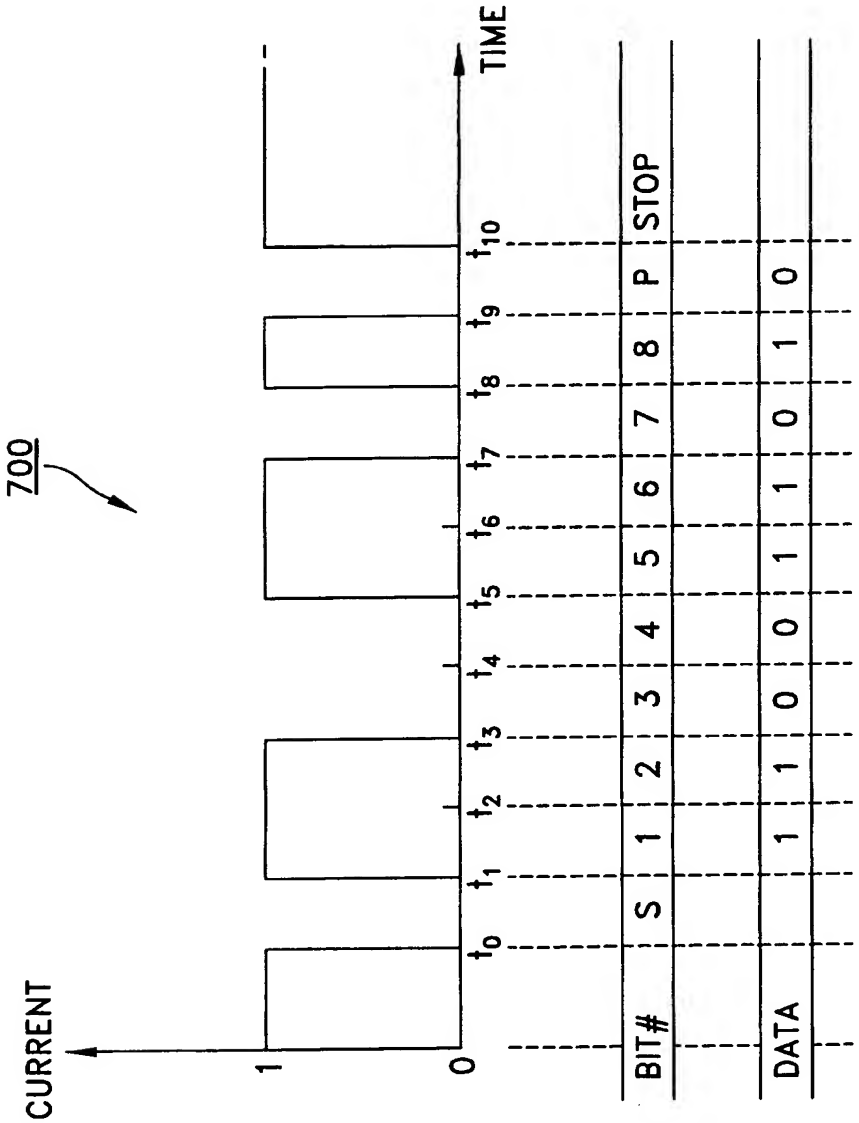

700
CURRENT
TIME
1
0
t_0
t_1
t_2
t_3
t_4
t_5
t_6
t_7
t_8
t_9
t_{10}
BIT#
S
1
2
3
4
5
6
7
8
P
STOP
DATA
1
1
0
0
1
1
0
1
0

FIG. 7

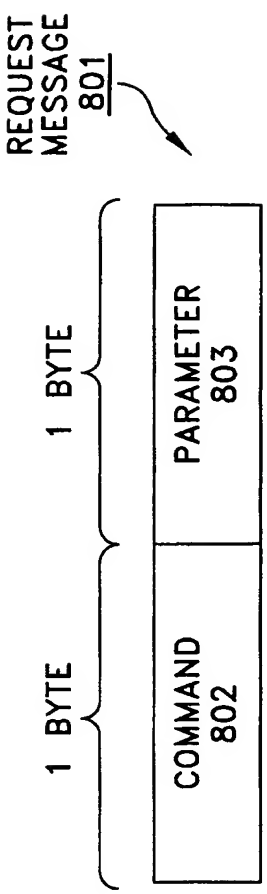

REQUEST MESSAGE 801
1 BYTE
1 BYTE
COMMAND 802
PARAMETER 803

FIG. 8A

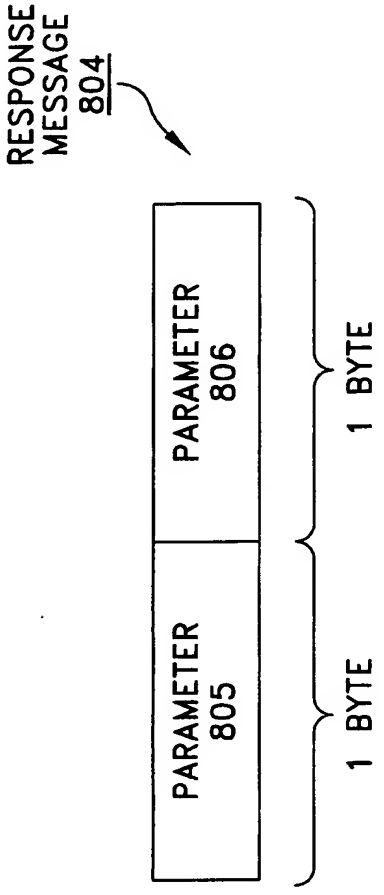
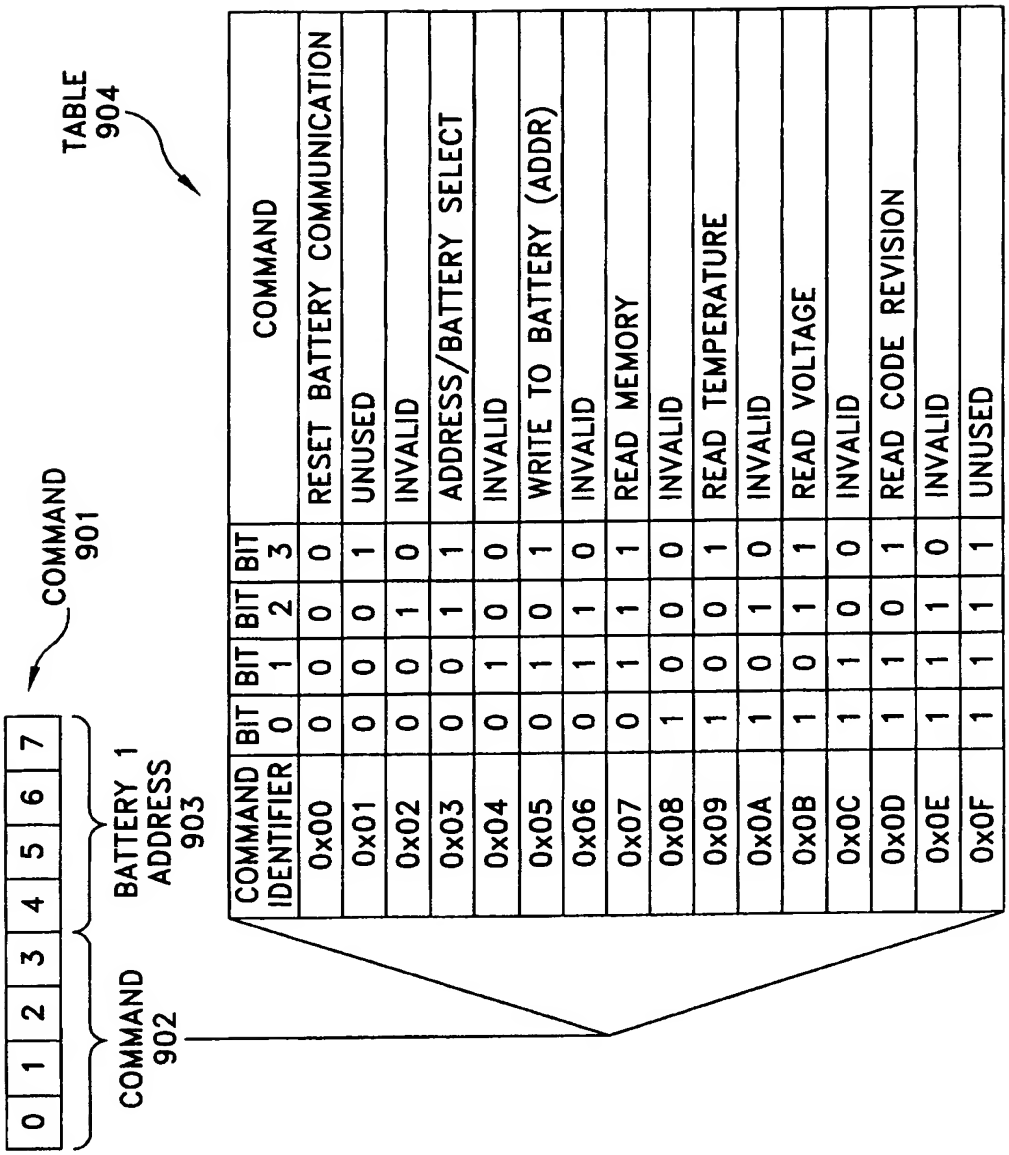

RESPONSE MESSAGE 804
1 BYTE
1 BYTE
PARAMETER 805
PARAMETER 806

FIG. 8B



COMMAND IDENTIFIER	BIT 0	BIT 1	BIT 2	BIT 3	COMMAND
0x00	0	0	0	0	RESET BATTERY COMMUNICATION
0x01	0	0	0	1	UNUSED
0x02	0	0	1	0	INVALID
0x03	0	0	1	1	ADDRESS/BATTERY SELECT
0x04	0	1	0	0	INVALID
0x05	0	1	0	1	WRITE TO BATTERY (ADDR)
0x06	0	1	1	0	INVALID
0x07	0	1	1	1	READ MEMORY
0x08	1	0	0	0	INVALID
0x09	1	0	0	1	READ TEMPERATURE
0x0A	1	0	1	0	INVALID
0x0B	1	0	1	1	READ VOLTAGE
0x0C	1	1	0	0	INVALID
0x0D	1	1	0	1	READ CODE REVISION
0x0E	1	1	1	0	INVALID
0x0F	1	1	1	1	UNUSED

FIG. 9

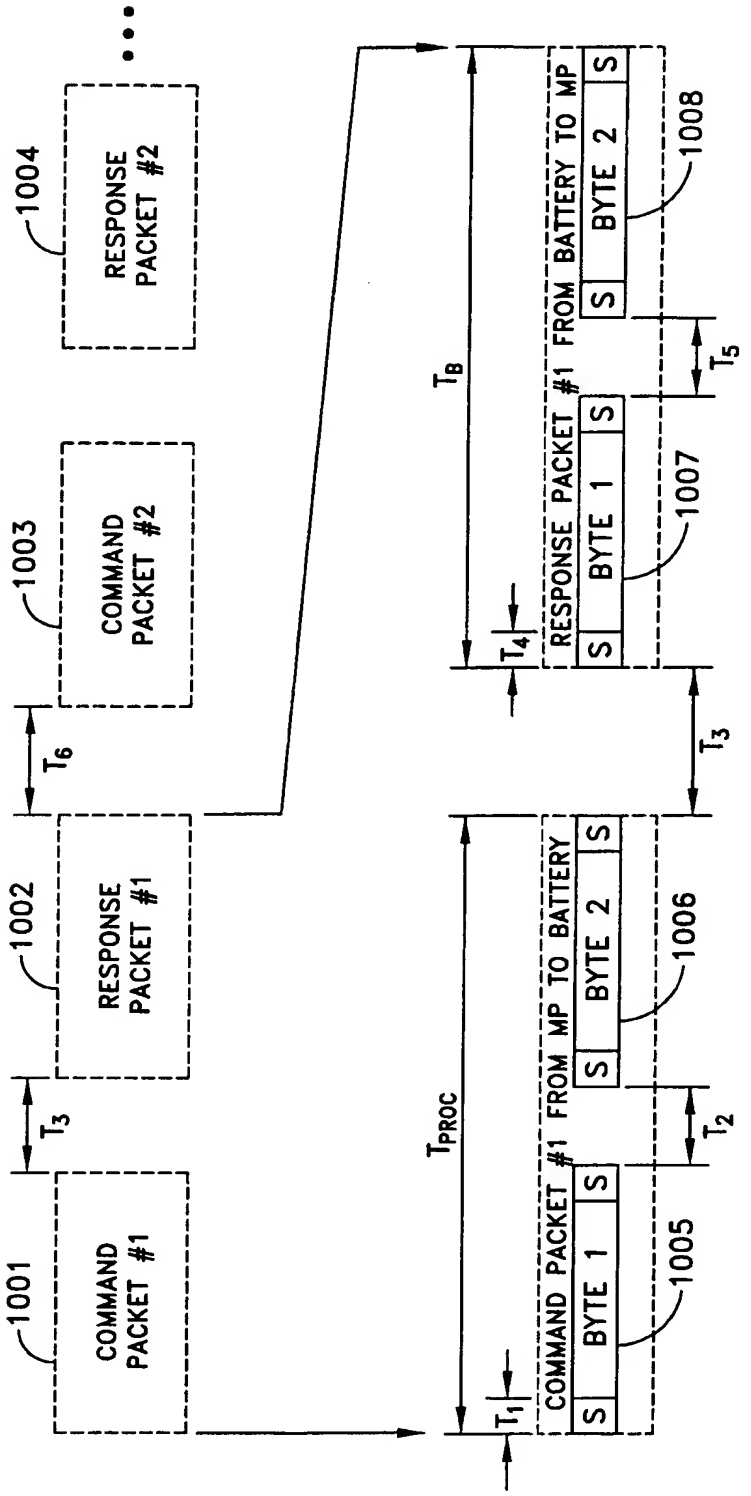

COMMAND PACKET #1
1001
RESPONSE PACKET #1
1002
COMMAND PACKET #2
1003
RESPONSE PACKET #2
1004
COMMAND PACKET #1 FROM MP TO BATTERY
S
BYTE 1
S
1005
RESPONSE PACKET #1 FROM BATTERY TO MP
S
BYTE 1
S
1007
S
BYTE 2
S
1006
S
BYTE 2
S
1008
T1
T2
T3
T4
T5
T6
TPROC
TB

FIG. 10

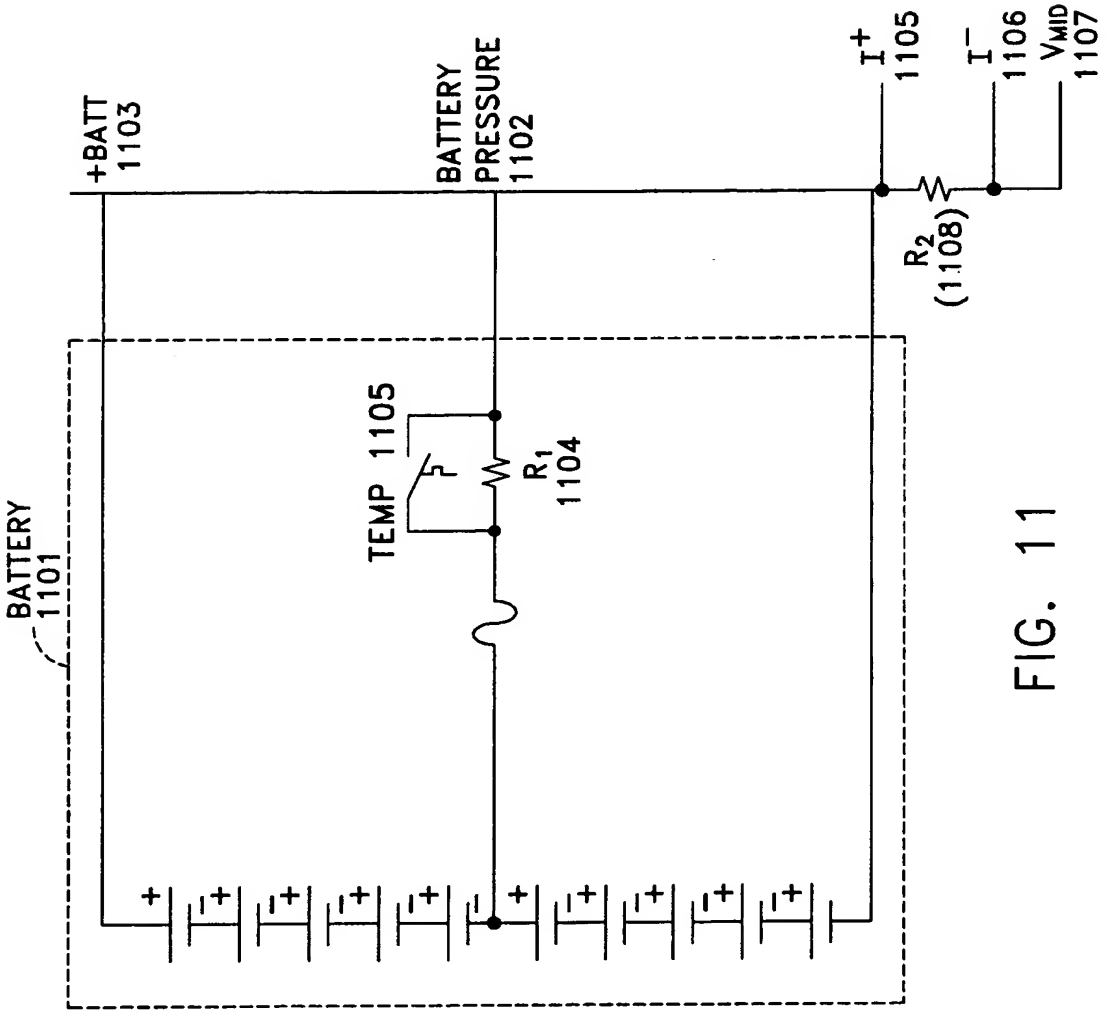

+BATT
1103
BATTERY
PRESSURE
1102
I+
1105
I−
1106
VMID
1107
R2
(1108)
TEMP 1105
R1
1104
BATTERY
1101

FIG. 11